"The Big 6"

Fuels Specialist Report

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Fire Purpose and Need for Action
The primary purpose of the Beaver Creek and Littlehorn AMP project is to achieve Revised Forest Plan objectives and strategies as listed below. Beginning in 2002, Forest employees and the public became aware of deteriorating fuels conditions within the majority of the watersheds in the west central portion of the Bighorn National Forest (BNF). Fuels conditions in the project area further deteriorated with the ongoing drought of 2000-2007. Insect and disease mortality include impacts from the white pine blister rust in limber pine, the Douglas-fir and Spruce-fir beetles in Douglas-fir and Engelmann Spruce, and dwarf mistletoe, commander blister rust, and western gall rust in lodgepole pine. While the sagebrush in this area is over mature over a widespread area.

Because of worsening fuels conditions, the Rocky Mountain Region of the Forest Service embarked upon an implementation initiative for the President's Healthy Forests Initiative. In response, the Bighorn NF developed a proposed schedule titled the Accelerated Watershed and Vegetation Restoration Plan, which included the Beaver Creek AMP and the Littlehorn Watershed Allotments project areas due to the known hazardous fuels conditions. Correspondingly, Big Horn and Sheridan County's and the Bureau of Land Management (Worland Field Office) have also identified fuels treatment project opportunities, which include and are adjacent to the Beaver Creek AMP and Littlehorn Watershed Allotment project areas. These are documented in the Community Wildfire Protection Plan (WFPP) prepared by the county's, included in the project record. All of these efforts and initiatives led to the development of this project, some of which include Wildland Urban Interface (WUI) areas as described in the National Fire Plan (www.fireplan.gov) and published in the Federal Register (2001). The Healthy Forests Initiative implements core components of the 15-year Implementation Plan and proposed treatments further the goals of the President's initiative. They will reduce the threat of catastrophic wildfires to protect communities, firefighters, wildlife, and forest health and will reduce the potential for accelerated losses from Douglas-fir beetle infestations.

These projects were conceived and primary analysis was conducted under the direction of the 2005 Revised Forest Plan. The goal is to increase the amount of forest and rangeland restored to or maintained in a healthy condition with reduced risk and damage from fire, insects and diseases, and invasive species within the identified sage/grass meadows and timber stands. The goal is to manage fuels and vegetation on approximately 15,000 acres within the 33,866 acre project area. Approximately 3% will be Aspen, 8% sagebrush, 13% meadow encroachment, and 21% timber stand treatments over the life of the project. This is a total of approximately 45% of the project area being treated over the life of the project or approximately 15,239 acres.   Fire management actions will be coordinated with Forest Service function staff, WYGF, BLM, and others to ensure that all needs and concerns are being addressed prior to implementation. The project meets other objectives and strategies described in the Revised Plan, those listed below are focal points for this project, and include Strategies 1, 3, 4, 5, 6 under Objective 1c; Objective 2c; and Strategy 2, Objective 1b.(pp. 1-2 thru 1-8 of Revised Forest Plan).

The following are the focal strategies:

- Place high priority on fuel reduction activities in Fire Regimes II and III (sagebrush/grass/timber) and other strategic areas where high fire hazards exist, such as communities identified in the Healthy Forest Restoration Act (Federal Register, Vol. 166, No. 160, Aug 17, 2001) or as identified in community wildfire protection plans.
- Implement suppression strategies as needed to minimize epidemic outbreaks of insect and disease in areas managed for timber production.
- Implement vegetation management practices that will move all affected landscapes toward desired vegetation composition and structure. Design management practices that maintain a mosaic of vegetative composition and structure emulating natural processes, patterns, scale, effect, and distribution of community types, age, and structure classes.
- Manage to retain or increase aspen stands.
- Maintain, protect, and enhance wetland function and value when analyzing or implementing all projects.
- Improve the capability of the Bighorn National Forest to provide a desired sustainable level of uses, values, products, and services.
- Proactively conserve populations of species at risk by maintaining or improving habitat availability and quality when designing projects based on species' habitat needs. Provide diversity in Habitat Structural Stages of forested vegetation, and age-class diversity of non-forested vegetation as needed.
- Within a geographic area, maintain 10% of existing forest cover types (except for spruce-fir) in old growth, and maintain 15% of spruce-fir cover type in old growth. In half the acres, meet both the standards and quality attributes identified in Mehl (1992).
- I n addition, when considering sagebrush treatment this project would follow the Wyoming Game and Fish Treatment recommendation for vasey and mountain big sagebrush will adhere to Wyoming Game and Fish Department recommendations (Wyoming Interagency Vegetation Committee. 2002).
- There are 14 management area prescriptions applied to the project area from the Revised Forest Plan (Table 1). The main management area prescriptions within the project area are 5.12, which call for an active multiple-use, rangeland vegetation and suited timber emphasis, 5.41, which calls for vegetation and travel management to enhance big game winter range. Management area prescriptions 1.31, 1.32, 1.33, 1.5, 2.2, 3.4, 4.2, 4.3, 5.11, 5.12, 5.13, 5.4, 5.41 and MW occur in the project area as well, and comprise a much smaller portion of the project area (Table 1). These emphasize dispersed recreation management, scenery, timber products, and wildlife habitat, respectively. The project meets the desired condition, theme, and standards and guidelines of these management prescriptions in the Revised Plan.
- Prescribed Fire treatments that will require smoke management permitting through the State's Department Environmental Quality (DEQ) division.

- For management in the roadless area, adherence to the current roadless rule direction at the time of implementation. For line construction for prescribed burning within the roadless area will require approval from the Regional Office.
- Currently the Little Horn Prescribed burn and Hunt Mountain Prescribed burn and Aspen Regeneration NEPA projects lie within the Little Horn and Beaver Creek allotment project area.
- Table 1. Number of acres broke out for each a management Unit identified in project areas.

Management Unit	Unit Description	Acres
1.31	Backcountry Recreation Non-motorized Use	7,961
1.32	Backcountry Recreation Summer Use w/ Limited Winter Motorized Use	9,118
1.33	Backcountry Recreation Non-motorized w/limited Summer & Winter motorized Use	4,337
1.5	National River System Wild Rivers	10,994
2.2	Research Natural Area	4,845
3.4	National River System Scenic Rivers Outside Wilderness	2,891
4.2	Scenery	6,268
4.3	Dispersed Recreation	1,435
5.11	Forest Vegetation Emphasis	21,586
5.12	Rangeland Vegetation Emphasis	46,798
5.13	Forest Product	17,949
5.4	Plant and Wildlife Habitat	6,996
5.41	Deer and Elk Winter Range	17,314
MW	Medicine Wheel National Historic Landmark & Vicinity	2,034
	Project Total Acres	**172,606**

In addition to implementing Forest Plan direction, the purpose of the project is to achieve the Healthy Forest Restoration Act and the Healthy Forest Initiative goals and objectives.

An analysis of existing conditions for fire management and fuels has been completed on the forest contained within the assessment area. The analysis focused on fire history, fire regime classification and associated condition class, fire risk, fire hazard and values at risk.

The lack of fire occurrence within the assessment area has resulted in a homogenous layer of timber with minimal breaks in continuity. Tree mortality has been significant as a result of Douglas fir bark beetle attack. Aspen stands have been converted to stringers of aspen overgrown with Douglas fir and Engelmann spruce.

Existing Conditions

The vegetation within the analysis area consists of Douglas fir, Engleman spruce, Lodge Pole pine, Limber pine, Aspen, sagebrush and grass meadows. The stands are in a variety of seril stages and vegetative health. Several factors that contribute to the varying stages of health include insect and disease, drought, over mature stands, increased stand growth reducing meadow sizes, fire suppression and lack of fire occurrence. These factors all contributed to creating a landscape that is highly susceptible to a significant wildfire disturbance. Further aspen issues will be addressed in the aspen specialist report.

The forest has experienced 8 years of drought which has lead to weaker trees, which in turn makes them more susceptible to insect and disease. The insect epidemic that initiated in the late 1990's has significantly impacted the fuels within the analysis area. Field reviews conducted in 2007-08, estimated that timber stands are experiencing a 30 – 40% mortality from Insect and disease which include impacts from the white pine blister rust in limber pine, the Douglas-fir and Spruce-fir beetles in Douglas-fir and Engelmann Spruce, and dwarf mistletoe, commander blister rust, and western gall rust in lodge pole pine. The level of current mortality is creating an increase of dead fuels buildup on the ground and an increase of red needles in the aerial fuels. As fires occur in these timber types they will likely be stand replacing and high intensity.

Additional contributing factors affecting the area include heavy mortality in limber pine from white pine blister rust and mountain pine beetle. Engelmann spruce is under attack from spruce beetles from the east. Douglas fir beetles have decimated stands further down the Shell drainage and contain approximately 60 – 80% mortality.

Fire suppression over the last 100 years in the area, these stands have become decedent and are beginning to breakdown, leading to an increase of dead material building up on the forest floor. In 2007 the Bone creek and in 2003 Littlehorn 2 fires occurred within a portion of the analysis area and burned approximately 21,075 acres of various intensity levels. Changing some stands to an early seril stage in the Douglas fir and lodge pole pine stands, while creating natural fuel breaks.

Fire History
An average of seventeen lighting fires per decade has occurred in the analysis area based on data from 1970 through 2008 (Table 2). These fires burned a total of 11,164 acres over the 38-year period. However, because of the location of the analysis area, fires that start just outside the boundary impact the area (Table 3). Approximately eight additional fires occurred within two miles of the boundary each decade. These fires burned a total of 2652 acres over the 38-year period. Humans accounted for an additional number of fires with within the analysis area (Table 4). Between 1970 and 2008, humans started nineteen fires that burned 5862 acres.

Table 2. Number of lighting fires and acres burned by decade in the Littlehorn and Beaver Creek Watershed Analysis Areas.

Decade group	Fires per decade	Acres burned per decade
1970-1979	14	111

1980-1989	14	17
1990-1999	20	961
2000-2008	21	21,075
Totals	**69**	**22,164**

Table 3. Number of lighting fires and acres burned per decade within two miles of the Littlehorn and Beaver Creek Watershed Analysis Areas.

Decade group	**Fires per decade**	**Acres burned per decade**
1970-1979	4	47
1980-1989	3	1801
1990-1999	0	0
2000-2008	1	804
Total	**8**	**2652**

Table 4. Number of fires, percent of total fires, number of acres, percent of total acres burned by cause in the fro Littlehorn and Beaver Creek Watershed Analysis Areas from 1970 through 2008.

Cause	**Number of fires**	**Percent of total fires**	**Acres burned**	**Percent of total acres burned**
Lighting	69	79	22,164	79
Equipment	1	1	.1	.1
Smoking	3	3	.4	.2
Campfire	10	12	21	.7
Children	2	2	1320	4
Miscellaneous	3	3	4521	16
Total	**88**	**100%**	**28,006**	**100%**

Some of the analysis area has been burned by prescribed fire in the past few years primarily in the sagebrush communities. However, it appears that less fire is occurring on the landscape level than occurred historically, particularly in the lower elevation vegetation types. This is in part due to fire suppression efforts which started early in the 1900s. Though the number of human caused fires has increased in this period, these generally have had little impact on the landscape due to fire suppression.

Wildland/Urban Interface

Wildland/urban interface is the line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Sites that fit this description within the analysis area are seven cow camps and three recreation residents (permit cabins) that were identified within the Forest Plan (Forest Plan 2005) and the Big Horn CWPP. The structures are only being identified and not analyzed for fuel treatment in this project. The structures are currently being analyzed for a fuels treatment under a different project. In addition, the seven cow camps are categorized as a

range improvement under a term grazing permit within the analysis area. 13,494 acres fall within the Shell municipal watershed boundary (Forest Plan 2005).

Fire Regime

A natural fire regime is a general classification of the role fire would play across a landscape in the absence of modern human mechanical intervention but including the possible influence of aboriginal fire use (Agee 1993; Brown 1995). Coarse-scale definitions for natural fire regimes were initially developed by Hardy and others (2001) and Schmidt and others (2002) and subsequently interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural fire regimes are classified based on the average number of years between fires (fire frequency or mean fire interval [MFI]) combined with characteristic fire severity reflecting percent replacement of dominant overstory vegetation. A description of Fire Regime and the percent each Fire Regime is represented in the analysis area can be found in Table 5.

Historic fire regimes within the analysis area range from frequent, non-lethal (Fire Regime I) to infrequent, stand replacing (Fire Regime V) (Hann and Bunnell 2001). Fire Regime I is the least common in the analysis area while Fire Regime II is the most common.

Table 5. Fire Regime descriptions, cover type, and percent occurring in the analysis area.

Fire Regime Group (Number, fire return frequency, intensity	Vegetation assigned to Fire Regime	Percent of Analysis Area
I: 0-35 yrs, non-lethal	Any cover type that contained ponderosa pine, aspen associated with ponderosa pine	1
II: 0-35 yrs, Stand replacing	Grassland, forbs, sagebrush, willow, or other shrubs	35
III: 35-100 yrs, mixed	Any cover type that included limber pine, Douglas-fir and lodgepole pine cover types where seral to Douglas-fir, Rocky Mountain juniper, aspen when associated with the above	30
IV: 35-100 yrs stand replacing	Lodgepole pine only, or aspen when associated with lodgepole pine	5
V: 100+ yrs, stand replacing	Subalpine fir and Engelmann spruce cover types and lodgepole pine or Douglas-fir when present as a seral to spruce-fir	25
N/A	Rock out croppings, scree slopes, mineral soils, Medicine wheel National Historic Landmark & vicinity	4

Table 6: The following table shows the approximate percent acres to be treated within each individual Fire Regime Group (FRG) over the project area, by trending the current Condition Classes from 2 & 3 toward a desired Condition class 1.

Fire Regime Group (FRG)	Current Condition Class	Total Acres	Approximate treated acres
1	1	1207	0
	2	3	0
	3	700	24
2	1	3556	0
	2	2806	294
	3	53,957	3952
3	1	8728	0
	2	27,810	4198
	3	15,432	1272
4	1	1049	0
	2	5064	467
	3	1745	164
5	1	5250	0
	2	0	0
	3	37,835	4868
N/A Unburnable		7463	0
	Approximate Treated acre Total	15239 acres	

Fire Regime I – This type of fire regime generally results in open stand conditions with small inclusion of greater density. Understories are generally sparse. Tree mortality may result in fuel accumulations that burn with greater intensity and severity than surrounding areas, creating holes in the stands in which ponderosa pine often regenerates.

Fire Regime II – Though the fire frequency in these types is similar to the forested communities, fire results in the top-kill of grasses and willows, and mortality of sagebrush, which is considered a "stand replacing" effect. In the grassland and willow communities vegetation development often occurs from the existing vegetation that resprouts. Sagebrush however, rarely resprouts and fire in this community results in seral stages that are dominated by grasses and forbs. Over time, sage brush resulting from seed will overtop the grasses and forbs and become the dominant vegetation.

Fire Regime III – Fire occurs less frequently in this regime than in I and II. Because disturbance occurs less often, vegetative density increases and fuels accumulate. As a

result fires are of greater intensity and severity that in Fire Regime I. Larger areas of mortality generally result, creating more diversity in age and size classes on the landscape.

Fire Regime IV – Fire frequencies in IV are similar to III. However, the result here is often larger areas of mortality. This occurs because the stand conditions in the lodgepole pine communities are different than the conditions found in the drier vegetative communities that make up Fire Regime III. Stand densities are often higher and lodgepole pine, due to its thin bark, is less resistant to fire than those found in II. Large fires in the lodgepole pine communities and spruce-fir types (Fire Regime V) on the Bighorn National Forest resulted in conjunction with high fuel loadings, drought, and wind. Non-lethal fires may have occurred in lodgepole pine forests at some time between the stand replacing events possibly at intervals short as 40 to 80 years. This frequency of fire in these types would have pruned and thinned some of the trees as well as reducing ground fuels increasing vegetative mosaics within stands.

Fire Regime V – Fire occurs much less frequently in this group and is stand-replacing when it occurs. Unlike the lodgepole pine communities found in Fire Regime IV, non-lethal events are likely not common in the communities in this regime except where lodgepole pine dominated as a major seral component.

Aspen – Fire has probably played an important role in the establishment of aspen stands. The mean fire interval for aspen appears to be related to the forest cover type with which it is associated. Even though aspen stands themselves are not highly flammable, these stands often burn when the adjacent stands burn particularly if they have understory conifers. The abundance of aspen likely fluctuated most notably with the frequency, size, and intensity of fires that are driven by climatic conditions.

Condition Class

Condition Class is a description used to identify the risk of stand replacing wildland fire. The relative rankings of 1, 2, and 3 are based on the number of naturally occurring fires that did not occur due to fire suppression efforts. Generally speaking, areas in Condition Class 1 are most inline with the natural fire cycles while areas in Condition Class 3 are least inline. Condition Class is used in conjunction with Fire Regime. .

Vegetative conditions can be used as an indicator of wildland fire hazard. Over the past several years there has been a national effort to develop and apply definitions for this hazard based on vegetation conditions (the National Fire Plan is the assemblage of these efforts). Condition Class serves as a proxy for several of the factors that affect the vulnerability of vegetation to sustaining a stand-replacing wildland fire given an ignition and the right weather conditions. These class assignments are based on assumptions about ground and ladder fuels and many other factors that contribute to wildland fire. In February 2001, the Bighorn National Forest developed a Condition Class assessment for the entire Forest. This assessment, with some modifications, was used to evaluate wildland fire hazard with in the analysis area.

The Bighorn National Forest assigned Condition Class based on a rule set that accounted for expected historical disturbances within each Fire Regime. For example, since the historical fire return interval in Fire Regime I is 0 to 35 years, areas than burned in the past 35 years would have been assigned a Condition Class of 1 (low hazard). The assumption in this case would be that fire would have altered fuel conditions to a level that an ignition would likely not result in a stand replacing wildland fire. Areas assigned to Conditions Class 3, high hazard, are those that have missed several fire cycles. The assumption in these areas is that fuels are such that wildland fires on acres assigned to this condition could very well be stand-replacing, which is a departure from the way wildland fire operated in this Fire Regime.

Condition Classes in the Analysis Area

Fire Regime I – This type of fire regime generally results in open stand conditions with small inclusion of greater density. Understories are generally sparse. Tree mortality may result in fuel accumulations that burn with greater intensity and severity than surrounding areas, creating holes in the stands in which ponderosa pine often regenerates. Regime 1 has 1910 acres within the assessment area. Which has 1207 acres in class 1, class 2 has 3 acres, and 700 acres are within condition class 3.

Group 2 includes IRI-CVU stand polygons with grass, sage or willow as the dominant cover type. The regime is described as a high frequency, high severity fire group with an historic fire return interval of 0 to 35 years and stand replacement burning. There are 60,319 acres of regime group 2 in the assessment area with 3556 acres in condition class 1, and 2,806 acres in condition class 2, and 53,957 acres in condition class 3.

Group 3 includes IRI-CVU stand polygons with Douglas fir, limber pine and Rocky Mountain juniper as dominant cover types. The regime is described to have a fire return interval of 35 to 100 years with mixed severity burning that includes a mixture of stand replacement and under burning. Stand age, drought conditions and fuel build-up from fire exclusion will help determine the final outcome of the mosaic pattern. There are 51,971 acres of regime group 3 within the assessment area, 8728 acres in condition class 1, and 27,810 acres are in condition class 2, and 15,432 acres in condition class 3.

Group 4 includes IRI_CVU stand polygons of lodgepole pine as the dominant cover type. The fire return interval is 35 to 100 years and has stand replacement severity burning. Regime group 4 has 7858 acres within the assessment area and 1049 acres are in condition class 1, 5064 acres in condition class 2, and 1745 acres in class 3.

Group 5 includes IRI-CVU stand polygons of subalpine fir, Engelmann spruce and aspen as dominant cover types. The fire return interval is in excess of 100 years and has stand replacement severity burning. Regime group 5 has 43,085 acres within the assessment area 5,250 acres are in condition class 1, and 37,835 acres are within class 2.

The treatment area identified within the analysis areas is almost entirely made up of fire regime groups 2, 3, and 5. These areas have already missed at least one fire return interval, and display many characteristics that put the area at risk for significant stand alterations as a result of uncharacteristic fire severity. With FRG 1 & 4 having the lowest acres within condition class 2 & 3 makes them the lowest priority for treatment. Treatment will occur within 1&4 FRG's only on a smaller scale, and will not be the priority target acres for treatment.

Meyer and Knight (2001) noted the rate of patch formation and the size of disturbance across the landscape is outside of historical. Mean fire return intervals have become longer and fire intensity is probably higher due to the amount and continuity of fuels. These conditions predispose the landscape to larger stand-replacing wildland fires that historically were non-lethal events. Fuel conditions in the wildland/urban interface are such that fires occurring in these areas are likely to be severe putting human life and developments at risk.

Fire Risk
The risk of a fire event occurring is called fire risk. It can be safely assumed that fire will occur within a fire adapted forest where fuel exists with certainty at some point in the future. There is no question of if a fire event will occur rather the proper question would be when a fire will occur.

The risk of an area burning when compared to its surrounding area is termed relative risk and provides a simple mechanism to weigh in factors that increase or decrease the relative risk of an area. There are three primary sources of risk that increase or decrease the relative risk of a fire occurrence. They are:

1. Ignition. Risk of ignition is highest where there is a build up of fuels. Particularly one hour fuels such as bug killed or dying trees increased ladder, ground and duff fuels.
2. Natural fire occurrence or lightning. Lightning tends to occur in known areas on a more frequent basis. These areas are referred to as lightning belts. The predictability of fire occurring in these zones is greater than outside of these zones.
3. Human activity. The relative risk or risk compared to the rest of the Forest is Moderate in areas where human utilization rates are moderate.

The relative risk if ignition has increased within the assessment area due to the standing dead trees being more susceptible to an ignition as a result of lightning. This risk will continue to increase as the trees start to fall and create growing space for more grasses and forbs under what has been a closed canopy situation until this point.

Human fire occurrence has not been a significant factor within the assessment area. There have been few Human caused fires in the area, but most of the fires have been human caused.

Human caused fire occurrence has been measured to account for 55.4 percent of all fires on the Bighorn National Forest since 1910. The assessment area has several factors that are recognized to increase the relative risk of a human caused fire occurrence. They are:

- There are several trails that run through the assessment area.
- There are two sheep camps and two cow camps within or near the assessment area.
- There is a scenic highway and Forest arterial road running through the northern portion of the assessment area.
- The historic Forest Long View guard station within the assessment area.
- There are two outfitter camps within the assessment area.
- Seeing increased dispersed recreation and ATV use.

Effects

Alternative 1, No Grazing/No Action Alternative

Direct Effects - Condition Class of the analysis area will continue to progress toward the high risk end until large fires occur. These fires will likely burn hotter, grow larger than historical fires, and be more resistant to control. The risk to firefighters and the public would be elevated. Risk in the wildland/urban interface would increase, in the WUI as identified in the Forest Plan/CWPP and to the Shell Municipal watershed. Protecting these developments and watershed would be more difficult and the availability of escape routes would decrease, increasing the risk to firefighter safety.

Indirect Effects -
Indirectly, the increase in buildup of fuels without treatment area would have potential negative effects on native species, watersheds, and air quality and landscape health in general. This is because fires are more likely to be more widespread, larger and with increased severity than what likely historically occurred. Larger wildfires may also make the area more difficult to administer for grazing should many improvements be burned (such as fences and water developments) or extended periods of rest be required to allow the vegetation to recover prior to reauthorizing grazing. Over time with this alternative, the lack of grazing would result in a greater abundance of fine fuels, allowing for the chance for wildfires to occur more readily and re-establish the appropriate condition class within the fire regimes, once the initial pulse of larger, more severe fires had occurred.

Cumulative Effects -
The only cumulative effects to condition class and fire regime with this alternative are the ongoing prescribed burning adjacent to the analysis area. These were approved under previous analysis, and largely target sagebrush burning. No change to the sage or timber fuels would occur, continuing to encroach of the meadows reducing forge for wildlife and

livestock. The area would continue to have the potential for effects by wildfire started either naturally or by human causes.

Alternative 2, No Change, grazing under current management

Direct Effects – The direct effects from this alternative would be similar to those described under Alternative 1**.**

Indirect Effects – The indirect effects associated with this alternative would be similar to those described in Alternative 1, with the exception that grazing would occur and reduce fine fuels in grassy type. This would serve to limit the spread of some wildfires. Without any additional prescribed burning proposed under this alternative as compared to Alternative 3, fuels would not be actively managed to help improve condition class and the associated benefits to native species and other resources.

Cumulative Effects -
The cumulative effects of this alternative would be similar to those described in Alternative 1, with the addition of continued livestock grazing.

Alternative 3 – Proposed Action, grazing with adaptive management

Direct Effects
In addition to the changes associated with livestock grazing proposed under this alternative, there would be a focus on fuels reduction efforts on portions of the forested and non-forested areas. An adaptive management approach would be applied to treat more of the affected areas of bug kill in forested stands, to alter predominantly mature sagebrush stands, to remove conifer encroaching in aspen stands, and to reduce conifers encroaching in meadows to reestablish desired condition classes of fuels. These treatments would serve to reduce the risk of more widespread and severe occurrences of wildfire, with its associated potential negative effects. Natural fuel breaks of different age classes of forested and non-forested vegetation, and more fire resistant aspen would be encouraged to better manage for fire related risks. Prescribed fire would be the primary treatment in the forested and non-forested vegetation types, mimicking natural processes. Prescribed fire that mimics a natural fire will result in a mosaic burn pattern. This pattern can be altered by ignition timing and sequence. It is estimated that over the life of the project that approximately 15,000 acres of vegetation will be treated by prescribed fire, mechanically, or with herbicide. This breaks out to approximately 5000 acres of grass and sage meadows with approximately 10,000 acres of timber stands treated to the desired condition class.   This is the equivalent of approximately 1,000 acres a year. The past 10 year average of prescribed burning on the District has only averaged 500 acres with approximately 175-250 acres of vegetation being consumed by burning due to the mosaic nature of the burns.   Prior to prescribe burning, burn permits will be required through Wyoming Department of Environmental Quality (WDEQ). These permits could limit the number acres that are treated by prescribed fire. All vegetative management

treatments will be managed for scenic integrity. Conifer removal from aspen stands may be done with prescribed fire or mechanically, however not likely through a commercial harvest, but by hand thinning.

These treatments combined would have the direct effect of trending condition classes that are in a category of 2 or 3 back to a 1, thereby enhancing the opportunity for natural vegetation diversity and reduced wildfire threat. Structures would be better protected in the event of wildfire, reducing the risk of loss.

Indirect Effects – The indirect effects associated with this alternative would serve to better protect native species, watershed, air quality and other values that could be negatively affected by potential widespread wildfires that would be more likely under alternatives 1 and 2. Similarly, livestock grazing improvements would be better protected and managed with an improved diversity in vegetation structural stages resulting from prescribed fire. Indirectly, livestock grazing rotations may also be affected when prescribed burns are planned, to allow for fine fuels availability. Prescribed fire could also indirectly reduce some recreation opportunities during periods of burning, however this would be minimal.

Cumulative Effects -
The cumulative effects of this alternative would be the addition of livestock grazing and additional prescribed fire as compared to Alternative 1. While livestock grazing could reduce some fire occurrences, this would be counteracted by application of prescribed fire. These proposed treatments would serve to improve fuels conditions and vegetation conditions, reducing potential cumulative effects in the analysis area. Prescribed burning will occur in the timber type. Within the 33,866 acre analysis area there is 3,260 acres of suited commercial timber. Only 734 acres of this suited commercial timber is located outside of a roadless area. There is to be no burning in the suited commercial timber base within the Wyoming Gulch C&H allotment.

- Noxious weed portion is discussed in the invasive weeds specialist report portion of this project.

- For management action within the roadless area, will require approval from the Regional Office.

- Aspen issue will be discussed in the Aspen Specialist report portion of this project.

Fire/Fuels Proposed Action

Alternative 3 as proposed by the Forest Service to meet the purpose and need over the next fifteen years will have a vegetative management project size of 33,788 acres within the 172,606 acre analysis area. Approximately 15,000 acres of the 33,788 will receive some type of vegetative treatment over the next fifteen years. The methods of treatment would include all of the following management options depending on available funding:

1. Treatment of approximately 5,000 acres of sagebrush would adhere to Wyoming Game and Fish Department recommendations for Vaseyana and Mountain Big Sagebrush (Wyoming Interagency Vegetation Committee 2002) and Forest Plan direction. A combination of prescribed burning and mechanical treatment (mowing, mulching, use of chemicals) in sagebrush and in timber where meadow encroachment is occurring. Treatments would strive for a mosaic pattern over the landscape, mimicking natural disturbance processes and age class diversity.
2. Mechanically treat aspen (thin, prune, rip) to promote regeneration and/or remove competing conifers. If aspen stands are being browsed to heavily by wildlife and or ungulates, fencing may need to be installed for protection of the stands until they grow out of browse height—about 6 feet tall. This will depend on available funding.

3. Use a combination of prescribed burning and mechanical treatment of sagebrush and timber (fire, thin, prune, mulching) with a fuels reduction objective that favors reducing risk of a crown-fire and/or establishes a diversity of age classes to reduce fuel continuity.
4. Prescribed burn 10,000 acres of lodgepole pine, Douglas-fir and Spruce-fir to return the stands back to their desired fire regime condition class and creating landscape fuel breaks, utilizing stand replacement fire.

Monitoring

Monitoring for fuels treatment will come from the Forest Plan in chapter 4: acres of fuels reduction accomplishments in fire regimes 1, 2, and 3.

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